

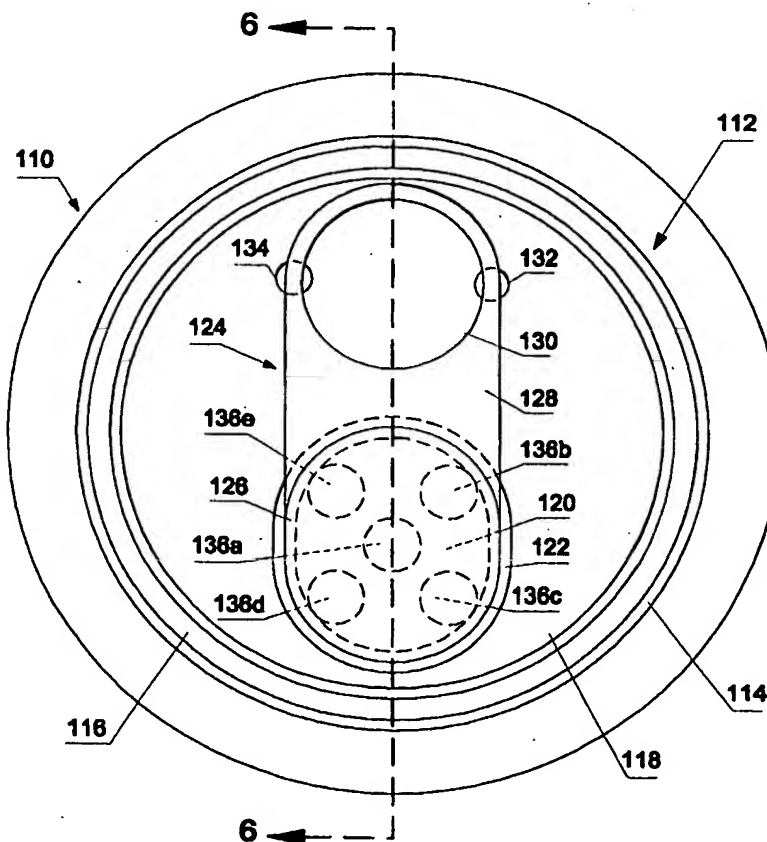
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(54) Title: PULL-OPEN CLOSURE FOR LIDS OF CANS OF DRINKS

(57) Abstract

A closure, which can be opened and closed again, for lids of cans of drinks, or the like, is provided with improvements which ensure greater hygiene for the drinks contained therein and greater safety for the consumer and which consist in providing each lid (12) of the can with a hole (20) for access to the drink, surrounded by a rim (22) which is curved towards the inside of the can so as to eliminate any cutting edge, and a closing member (24) which can be pulled free by means of the action of a lever (28) incorporated in a stopper (26) of the member (24) for closing the hole (20). The stopper (26) of the closing member (24), after pulling, can be re-inserted into the hole (20) so as to close the same hole (20) again should one wish to preserve a partially consumed beverage in the can.



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PULL-OPEN CLOSURE FOR LIDS OF CANS OF DRINKS

The present invention relates to a closure which can be opened and closed again, as required, for lids of cans of drinks, or the like, which ensures easy, hygienic and danger-free opening of holes formed in the lid of the aforementioned cans.

5 For a long time it has been known of cans for preserving drinks. These cans which are made of lightweight metal, such as aluminium, have a lid which can be opened in some portion by means of a pulling action on this portion, exerted by a lever into which at least one finger can be inserted. The aforementioned portion is delimited by an incision which produces a weakening line in the sheet
10 metal of the said lid so that a raising action, followed by a pulling action, on the lever causes the peripheral detachment of the delimited portion which remains attached to the lid solely by means of a thin strip of sheet metal.

This system is fairly practical since it allows rapid opening of the lid; however, it suffers from certain drawbacks:

15 a) when the delimited portion is detached from the sheet metal of the lid, it penetrates into the can with the risk of contaminating the drink contained therein;

b) detachment of the sheet metal of the delimited portion, since it occurs by means of tearing of a thin metal sheet, produces a hole with a sharp edge posing the risk of injury in the event that a person, and in particular a child, should
20 accidentally introduce a finger into this hole; and

c) once the can has been opened, it can no longer be closed again because the detached portion of the sheet metal can no longer be joined again to the remainder of the lid and hence the consumer is obliged to consume the entire beverage before it deteriorates irremediably or must throw away a beverage which

is only partially consumed.

No remedy has been found yet for the first two drawbacks, whereas the last mentioned drawback has been partially remedied by introducing onto the market, for each type of beverage, several different sizes of can with different capacities so as to allow the consumer to choose the can size containing the quantity of
5 beverage considered necessary.

This remedy, however, is of a very limited nature and involves drawbacks of greater costs for the manufacturer, who must supply several can sizes, greater store management costs in order to take account of the different can sizes and
10 general lack of satisfaction on the part of the consumer, who is obliged to choose between different can sizes.

The aforementioned drawbacks are overcome by the present invention relating to a closure, which can be opened and closed again, for lids of cans of drinks, or the like, comprising a closing member provided with a stopper to be
15 inserted into a hole in the lid of the can, characterized in that the stopper means comprises an enlarged head part containing, incorporated therein, a rigid lever and a neck part, having size such that it may be inserted with slight forcing into the hole, and anchored and sealed against a rim which is rounded and folded towards the inside of the hole in the lid.

20 According to a first embodiment, the closing member is provided with a stopper, the neck part of which is provided with a weight-reducing and yielding cavity terminating in a bottom face, the neck part being hot-deformable so that its cavity is shortened into a smaller cavity and the neck part has a protruding portion which engages inside the rounded and folded rim of the lid and have a thin and
25 weakened portion which is easily cut by a sharp edge of the said rounded and folded rim.

According to embodiments, from second to fourth, the closing member is provided with a stopper, the neck part of which is provided with a central solid portion against which there is fixed a flexible sealing foil which also engages with its raised and rounded rim underneath the rounded rim of the flat portion of the lid
5 against a layer of adhesive applied underneath the said rounded rim.

These second embodiments are based on the observation of some daily facts, in particular:

i) it is known how easily, in plastic containers for preserving food, which are closed by an aluminium laminated sheet or double layer of aluminium and plastic, an attempt at detaching the laminated sheet from the container results
10 instead in tearing of the laminated sheet in a portion far from the joint between the container and laminated sheet, whereas it would be desirable to achieve separation precisely at this joint;

ii) it is also known that, in so-called blister packaging for medical products in the form of pills or capsules, consisting of a rigid sheet of plastic material, provided with niches for containing the pills or capsules, and a sheet of aluminium soldered thereto by means of some known technique, such as heat-soldering or ultrasound soldering, it happens that, when a niche containing the medical product
15 is pressed, opening of the niche is always obtained by means of decisive tearing of the aluminium sheet accompanied by substantially insignificant detachment of the
20 aluminium sheet from the plastic one.

From these two observations it can be concluded that, in the case of a joint between plastic material and a metal sheet, in particular made of aluminium, it is easier to produce tearing in the aluminium sheet than separation thereof from the
25 joint.

These two facts, the first of which in particular does not appear to be

favourable, are used precisely in providing the pull-open closures for lids of cans according to these second to fourth embodiments.

The features of the present invention will be highlighted in particular in the claims forming the conclusive part of the present description; however, all the features and advantages will be pointed out more particularly from the following detailed description of its embodiments provided by way of non-limiting depiction, together with the enclosed drawings, in which:

- Figure 1 is a view, from above, of a can for drinks provided with a lid containing a first embodiment of a closure which can be opened and closed again according to the present invention;

- Figure 2 is a cross section view taken along the line 2-2 of embodiment according to Figure 1;

- Figure 3 is a partial cross section view, on a much larger scale, of the closing stopper of the embodiment according to Figure 1, before being inserted into the hole in the lid of the can;

- Figure 4 is a partial sectioned view, on a much larger scale, of the closing stopper of the embodiment according to Figure 1, after being inserted into the hole in the lid of the can;

- Figure 5 is a view, from above, of a can for drinks, provided with a lid containing a second embodiment of a closure which can be opened and closed again according to the present invention;

- Figure 6 is a cross section view along the line 6-6 of the embodiment according to Figure 5;

- Figure 7 is a partial cross section view, on a much larger scale, of the closing stopper of the embodiment according to Figure 5, before being inserted into the hole in the lid of the can;

- Figure 8 is a partial cross section view, on a much larger scale, of the closing stopper of the embodiment according to Figure 5, after being inserted into the hole in the lid of the can;

- Figure 9 is a partial view, from above, of a third embodiment of a closing member for a can of drinks according to the present invention;

- Figure 10 shows a sectional view along the line 10-10 of Figure 9;

- Figure 11 shows a method for assembly of the closing stopper, according to the third embodiment of the invention, into the hole of the can lid;

Figure 12 is a view, from above, of a can for drinks provided with a fourth and most simplified embodiment of a closure according to the present invention;

- Figure 13 is a cross-sectional view along the line 13-13 of Figure 12; and

- Figure 14 shows a method for assembly of the closing stopper, according to the fourth embodiment of the invention, into the hole of the can lid.

If we consider first of all Figures 1 to 4, it can be seen that a can 10 is provided with its usual lid 12 comprising an external rim 14 to be fastened to the neck-like constriction of the can body, a circular fitting rim 16 and a substantially flat circular portion 18 which has formed in it, by punching, a substantially ovoidal hole 20 with the obvious function of allowing extraction or pouring of the beverage from the same can 10. The hole 20 is surrounded by a rim 22 which is folded towards the inside and raised and has a semi-circular cross-section obtained by means of punch-deformation while the hole 20 is being cut.

The hole 20 is closed by a closing member 24 formed by a stopper 26 made of plastic material and having incorporated in it a lever 28 made of rigid material, such as metal, and provided at the end farthest from the stopper 26 with a hole 30 into which the consumer can insert a finger. Two shoulders 32 and 34,

obtained by means of deformation of the substantially flat portion 18 of the lid 12, serve as a support for the lever 28 so as to prevent involuntary operation thereof in the event of falls, knocks or stacking of several cans.

5 The lever 28 of the closing member 24 is also provided in the portion incorporated by the stopper 26 with holes 36a-e having the function of favouring incorporation of the lever in the said stopper 26.

The stopper 26 is made of fairly pliable plastic material, such as for example polyethylene terephthalate (PET) for alimentary use, which also has the property of being easily deformable by heat.

10 For a better understanding of this first embodiment of the invention, reference should now be made in particular to Figures 3 and 4 showing the enlarged detail of the stopper 26 which has incorporated in it the lever 28 and which has an enlarged upper head 40 and a lower narrow neck portion 42 provided with a weight-reducing and yielding cavity 44. The narrow neck 42 has such a size
15 that it can be introduced with slight forcing into the hole 20 surrounded by the rounded rim 22 folded towards the inside and the height of the neck 42 is such as to project well below the flat portion 18 of the lid, once the stopper 26 has been introduced into the hole 20 until the head 40 rests on the rounded rim 22. At this point a heated mould punch (not shown) is inserted into the cavity 44, pressing on
20 the bottom face 46 of the narrow neck 42, which is deformed, lowering the cavity 44 and assuming the size indicated by 44a in Figure 4 and causing the neck 42 to protrude beyond the rounded rim 22 and assume the shape shown in Figure 4, which, with the protruding portions 48 soldered against the internal surface of the rounded rim 22, ensures hermetic sealing of the stopper 26 inside the hole 20 of
25 the can lid. Inside the neck 42, between the protruding portions 48 and its bottom face 46, a particularly thin and weakened portion 50 is formed, said portion being

cut inside by an internal edge 25 of the rim 22, when, upon operation of the lever 28, the closing stopper 26 is raised.

As a result of this action, the stopper clears the hole 20, so that one has access to the drink and, moreover, the neck 42 of the stopper 26 again has such a size that it can be inserted with force into the hole 20, allowing provisional closing again of the can, should the said beverage not have been entirely consumed.

It can be understood, therefore, how the closing member 24 according to the first embodiment of the present invention manages, not only to close in an economic, safe and hygienic manner the hole 20 present on the lid 12 of the can 10, but also allow closing again of the same can, should one intend to finish off consumption of the beverage contained therein at a later time.

By way of a secondary consideration, it must be stated that such a closure has a cost substantially the same as that of the pull-type closures involving tearing of pre-incised sheet metal according to the prior art, which, however, cannot be closed again, but at a much lower investment cost since the necessary equipment is much simpler and cheaper, and also has a lower operating cost because this equipment, which is so simple and cheap, requires more simple and less frequent maintenance and conditioning operations than those necessary for the equipment designed for the manufacture of the said pull-type closures according to the prior art.

A second embodiment of a closure which can be opened and closed again according to the present invention is depicted in Figures 5 to 8.

If we consider in this case Figures 5 to 8, it can be seen that a can 110 is provided with its usual lid 112 comprising an external rim 114 to be fastened to the neck-like constriction of the can body, a circular fitting rim 116 and a substantially flat circular portion 118 which has formed in it, by means of

shearing, a substantially ovoidal hole 120 with the obvious function of allowing extraction or pouring of the beverage from the same can 110. The hole 120 is surrounded by a rim 122 which is folded towards the inside and raised and has a semi-circular cross-section obtained by means of punching while the hole 120 is being cut.

The hole 120 is closed by a closing member 124 formed by a stopper 126 made of plastic material and having incorporated in it a lever 128 made of rigid material, such as metal, and provided at the end farthest from the stopper 126 with a hole 130 into which the consumer can insert a finger. Two shoulders 132 and 134, obtained by means of deformation of the substantially flat portion 118 of the lid 112, serve as a support for the lever 128 so as to prevent involuntary operation thereof in the event of falls, knocks or stacking of several cans.

The lever 128 of the closing member 124 is also provided in the portion incorporated by the stopper 126 with holes 136a-e having the function of favouring incorporation of the lever in the said stopper 126.

The stopper 126 is made of fairly pliable plastic material, such as for example PET for alimentary use.

For a better understanding of this second embodiment of the invention, reference should now be made in particular to Figures 11 and 12 showing the enlarged detail of the stopper 126 which has incorporated in it the lever 128 and which has an enlarged upper head 140 and a lower narrow neck portion 142 provided with a peripheral weight-reducing and yielding cavity 144 and a solid portion having a supporting and anchoring function described further below. The narrow neck 142 has such a size that it can be introduced with slight forcing into the hole 120 surrounded by the rounded rim 122 folded towards the inside and the height of the neck 142 is such as to project slightly below the flat portion 118 of

the lid, once the stopper 126 has been introduced into the hole 120 until the head 140 rests on the rounded rim 122. At this point a flexible sealing foil 150 is applied, said foil resting against the bottom surfaces of the neck portion 142 and the solid portion 146 with its bottom 152, being bonded by any known means, such as thermo-welding or ultrasonic welding.

The flexible foil 150 is also provided with a raised and rounded rim 154 which has size such as to be inserted, with a high degree of precision, underneath the rounded rim 122 of the solid portion 118 of the lid 112 of the can where a layer of adhesive 156 needs merely to be activated in order to perform complete sealing of the hole 120 by the foil 150.

The procedure for opening of this closing member 124 is as follows:

When, following insertion of a finger into the hole 130, the lever 128 is raised, the stopper 126 is also raised. As a result, the neck portion 142 of the stopper 126 is also raised, rising up along the hole 120 formed in the flat portion 118 of the lid 112. The solid portion 146, which is connected to the neck 142 of the stopper 126, is also raised, raising the foil 150 fixed thereto. During raising, the bottom 152, which is firmly joined to the solid portion 146 of the stopper 126, draws the foil 150 with it so as to bring it up against an internal edge 125 of the folded and rounded rim 122, causing tearing of the said foil, since, with the foil being made of suitably chosen material, such as annealed aluminium, and the bottom 152 thereof being firmly joined to the solid portion 146 of the stopper 126, it is much easier for the said foil 150 to tear rather than for its bottom to be detached from the solid portion 146, similarly to what happens in so-called "blister" packs enclosing pills or capsules of medical products, as above already told. In this specific case, the foil 150 is cut by the edge 125 rather than its bottom 152 being detached from the solid portion 146 of the stopper 126.

The result is that the hole 120 remains open, allowing the drink to be drawn from the can 110. If one wishes to close again provisionally the hole 120, it is sufficient to introduce again the neck 142 of the stopper 126 into the same hole 120, obtaining a satisfactory closure since the neck 142 fits with sufficient precision in the hole 120 and the residual parts of the foil 150 which remain attached to the solid portion 146 after pulling do not constitute a serious obstacle to closing again.

The closure according to the second embodiment of the present invention is manufactured in the following manner:

Once the stopper 126 has been introduced into the hole 120, a tool, placed underneath the lid 112, raises the foil 150 and forces it to be joined to the solid portion 146 of the stopper 126 and to the adhesive 156 located underneath the rounded and folded rim 122.

Application of heat or ultrasound ensures soldering of the foil 150 to the solid portion 146 and to the rounded rim 122.

Let us now consider Figures 9 to 11 showing a third embodiment of a closure according to the invention, Figure 11 of which shows in detail a method of assembly thereof.

According to this third embodiment, with particular reference to Figures 9 and 10, it can be seen that a closing assembly 294 having the function of closing a hole 220 on the flat portion 218 of a can lid, where the hole 220 is surrounded by a raised and inwardly curved rim 222, comprises a composite stopper 296 which has secured to it an opening lever 298 composed of two opposite legs 298a and 298b joined, in the vicinity of the stopper 296, to a tongue 300 inserted by means of moulding in a wafer 302 of the composite stopper 296.

The composite stopper 296, as can be seen in particular in Figures 10 and

11, is obtained by means of shearing of the opening lever 298 with the tongue 300 embedded in the said wafer 302, which is obtained by means of injection moulding of some plastic material suitable for food, such as PET for alimentary use. It is possible to conceive of the wafer 302 being composed of an upper portion 302a and a lower portion 302b enclosing between them the tongue 300 forming part of the opening lever 298.

The lower portion 302b of the wafer 302 terminates in a flat face 302c designed to support, soldered to it, a sheet 304 formed essentially of metal, such as annealed aluminium or, preferably, a combined sheet formed by a layer 304a of aluminium and a layer 304b of PET for alimentary use. The sheet 304 is delimited circumferentially by a rounded rim 306, which is folded downwards and dimensioned so as to be inserted into the raised and inwardly curved rim 222 delimiting the hole 220 in the can lid. The rounded rim 306 of the sheet 304 has, preferably, a bottom aluminium layer and an upper plastic layer for allowing soldering of the sheet 304 to the can lid.

Assembly and sealing of this third embodiment of the invention is performed as follows:

initially the composite stopper 296 and the sheet 304 are formed with their shapes shown in Figure 11 by means of injection moulding and shearing, respectively. Then the composite stopper 296, with its wafer 302, is arranged above the hole 220 in the can lid and the combined sheet 304 is arranged underneath the same hole 220, they are brought together until they come into contact with one another and with the bottom side of the can lid, and the wafer 302, the sheet 304 and the curved rim 222 of the hole 220 in the can lid are soldered together.

Soldering can be performed by means of thermal effects or by the

application of ultrasound. In any case, a secure and tight joint is obtained between the closing assembly 294 and the can lid owing to the same properties which ensure the closure of blister packs for pills and capsules containing medical products. If, in order to obtain the tight closure, the layer 304b of PET on the sheet 304 were not sufficient, it would be possible to add a special layer of adhesive 308 inside the raised and curved rim 222.

Figure 12 shows a lid of a can for drinks provided with a fourth and most simplified embodiment of a closure according to the invention and Figures 13 and 14 show respectively a sectional view of the same closure and how it can be assembled so as to close a hole on the can lid.

Referring to Figures 12 to 14, it can be seen that a lid 412 for cans comprises an external rim 414, to be secured to the neck of a can, and a flat circular portion 418 which has formed in it, by means of shearing, a substantially circular hole 420 with the obvious function of allowing extraction or pouring of the beverage from the same can. The hole 420 is surrounded by a rounded rim 422 which is folded towards the inside and has a cross-section of a quarter of circle obtained by means of punching while the hole 420 is being cut.

The hole 420 is closed by a closing member 424 formed by a stopper 426 made of plastic material, such as PET, and having a surrounding lever 428 made of the same material of the stopper 426, for example PET, and provided at the end farthest from the stopper 426 with a hole 430 into which the consumer can insert a finger. The lever 428 surrounds with two legs 428a and 428b the stopper 426, being separated therefrom by an almost whole circular cut 427 interrupted by a flexible bridge 429 connecting the two legs 428a and 428b to the stopper 426. Of course, the whole closing member 424, comprising the stopper 426, the lever 428 and the connecting bridge 429, is usually moulded in one piece from PET

material.

Under the stopper 426 is inserted a cap 504, obtained by punching a thin foil of annealed aluminium, which have the duty of sealing the inside of the can. To this purpose, a layer 506 of heat or sound activable adhesive is spread on the
5 bottom side of the stopper 426 and a similar layer 508 of adhesive is spread on the inside of the rounded rim 422. Alternatively, a layer of adhesive can be spread on the outside of the cap 504.

To close the lid 412 according to the fourth embodiment of the invention the closing member 424 is lowered, in accordance with the arrow 510, to have the
10 stopper 426 abutting on the rounded rim 422 of the hole 420 and the cap 504 is raised, in accordance with the arrow 512, to have the cap abutting against the inside of the rounded rim 422. Then either heat or sound vibrations are applied to activate the adhesive layers 506 and 508, providing the sealing of the hole 420.

To open the hole 420 of the lid 412, the user raises the lever 428 by
15 inserting a finger in its hole 430. The raised lever 428 operates as a second class lever having power applied at the hole 430, fulcrum at the junction of the two legs 428a and 428b and resistance at the bridge 429. The stopper 426 is raised at the side near the bridge 429 and, consequently, the aluminium foil of the cap 504 begins to be cut by the sharp edge of the rounded rim 422. A subsequent complete
20 raising of the lever 428 removes completely the closing member 424 from the hole 420, providing a clean cut of the aluminium foil of the cap 504. As the stopper 426 has a lower neck shaped portion conforming to the rounded rim 422, the stopper 426 itself is suited to close again the hole 420

Only some embodiments of the invention have been described and above
25 depicted and may be subject to logical changes and variations all of which are to be considered as protected in the claims forming the conclusive part of the present

description.

For example, instead of shoulders 32, 34 and 132, 134 on the substantially flat circular portion 18 and 118 of the lid 12 and 112 for supporting the said levers 28 and 128, it would be possible to provide shoulders descending from the said
5 levers and resting on substantially flat circular portions. Further, the lever 28, 128, instead of being made of metal, could be made of plastic material, such as PET, so that the stopper 26, 126 and the lever 28, 128 can be moulded in just one piece.

Claims

1. Closure, which can be opened and closed again, for lids of cans of drinks, or the like, comprising a closing member (24, 124) provided with a stopper (26, 126) to be inserted into a hole (20, 120) of the lid (12, 112,) of the can, characterized in that the stopper means (26, 126) comprises an enlarged head part (40, 140) containing, incorporated therein, a lever (28, 128) and a neck part (42, 142) which has size such that it may be inserted with slight forcing into the hole (20, 120), and anchored and sealed against a rim (22, 122) which is rounded and folded towards the inside of the hole (20, 120) of the lid (12, 112).

2. Closure which can be opened and closed again, according to Claim 1, characterized in that the closing member (24) is provided with a stopper (26), the neck part (42) of which is provided with a weight-reducing and yielding cavity (44) terminating in a bottom face (46), the neck part being hot-deformable so that its cavity (42) is shortened in a smaller cavity (44a) and the neck part (42) has a projecting portion (48) which engages inside the rounded and folded rim (22) of the lid (12) and have a thin and weakened portion (50) which is easily cut by a sharp edge (25) of the said rounded and folded rim (22).

3. Closure which can be opened and closed again, according to Claim 1, characterized in that the closing member (124) is provided with a stopper (126), the neck part (142) of which is provided with a central solid portion (146) against which a flexible sealing foil (150) is fixed, said foil also engaging with its raised and rounded rim (154) underneath the rounded rim (122) of the flat portion (118) of the lid (112) against a layer of adhesive (156) applied underneath the said rounded rim (122).

4. Closure which can be opened and closed again, according to Claim 3, characterized in that the flexible sealing foil (150) is made of two superimposed

layers, an upper layer of plastic material, such as polyethylene, and a lower layer of annealed aluminium, the upper layer having the duty of helping the adhesion of the foil (150) against both the rounded rim (122) and the bottom of the stopper (146) and the lower layer having the duty of conferring the necessary strength to the foil (150).

5. Closure which can be opened and closed again, according to Claim 2, characterized in that the hole (20) in the lid (12) of the can has an ovoidal shape and the stopper (26) of the closing member (24) is provided with a neck part (42) which is also ovoidal and is forcedly inserted into the hole (20).

6. Closure which can be opened and closed, according to Claim 3, characterized in that the hole (120) in the lid (122) of the can has an ovoidal shape and the stopper (126) of the closing member (124) is provided with a neck part (142) which is also ovoidal and is forcedly inserted into the hole (120).

7. Closure, which can be opened and closed again, for lids of cans of drinks, or the like, comprising a closing member (294) provided with a stopper (296) to be inserted into a hole (220) of the lid (212) of the can delimited by a raised and inwardly curved rim (222), characterized in that the stopper means (296) comprises an opening lever (298) composed by two opposite legs (298a, 298b) and a tongue (300) inserted in a plastic wafer (302), the wafer (302) being composed by an upper portion (302a) and a lower portion (302b) enclosing between them the tongue (300) of the opening lever (298), the lower portion (302b) of the wafer (302) terminating in a flat face (302c) supporting, soldered to it, a sheet (304) of annealed aluminium, the sheet (304) being delimited circumferentially by a rounded rim (306) folded downwards and sized to be inserted in the curved rim (222) of the hole (220) and an adhesive (308) being spread inside the curved rim (222) to provide a tight sealing of the aluminium

sheet (304) against the curved rim (222).

8. Closure, according to claim 7, characterized in that the plastic wafer (302) is moulded from PET and the sheet (304) comprises an upper layer (304b) of PET and a lower layer (304a) of aluminium.

5 9. Closure, which can be opened and closed again, for lids of cans of drinks, or the like, comprising a closing member (424) provided with a plastic stopper (426), made of PET, to be inserted into a hole (420) of the lid (412) of the can delimited by a raised and inwardly curved rim (422), characterized in that the stopper (426) is surrounded by a lever (428) of the same material of the stopper
10 (426) and provided, at the end farthest from the stopper (426), with a hole (430) into which a consumer can insert a finger, the lever (428) having two legs (428a, 428b) surrounding the stopper (426) and separated therefrom by a circular cut (427) interrupted by a flexible bridge (429) connecting the two legs (428a, 428b) of the lever (428) to the stopper (426) and under the stopper (426) is inserted a cap
15 (504), punched from an aluminium sheet, sealing by means of adhesive layers (506, 508) the inside of the can.

10. Closure, according to claim 9, characterized in that a first adhesive layer (506) is spread on the bottom side of the stopper (426) and a second adhesive layer (508) is spread on the inside of the rounded rim (422).

20 11. Closure, according to claim 9, characterized in that just one adhesive layer is spread on the outside of the cap (504).

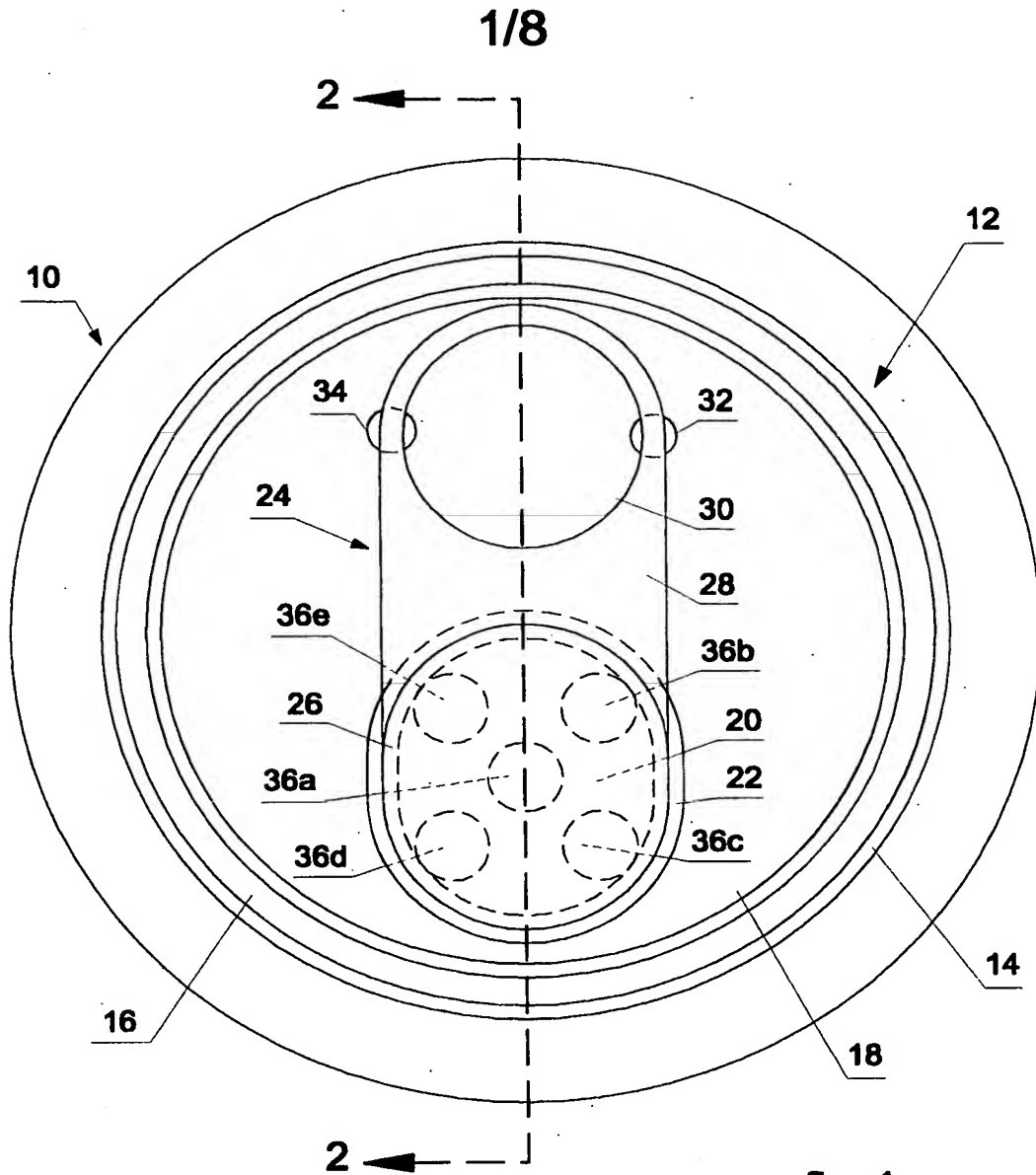


fig. 1

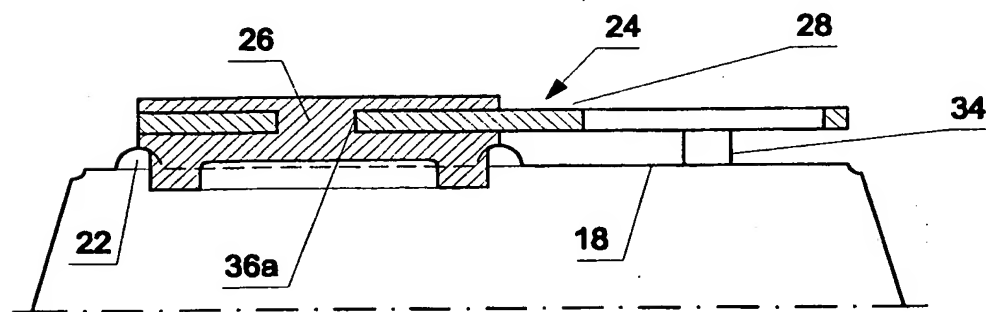


fig. 2

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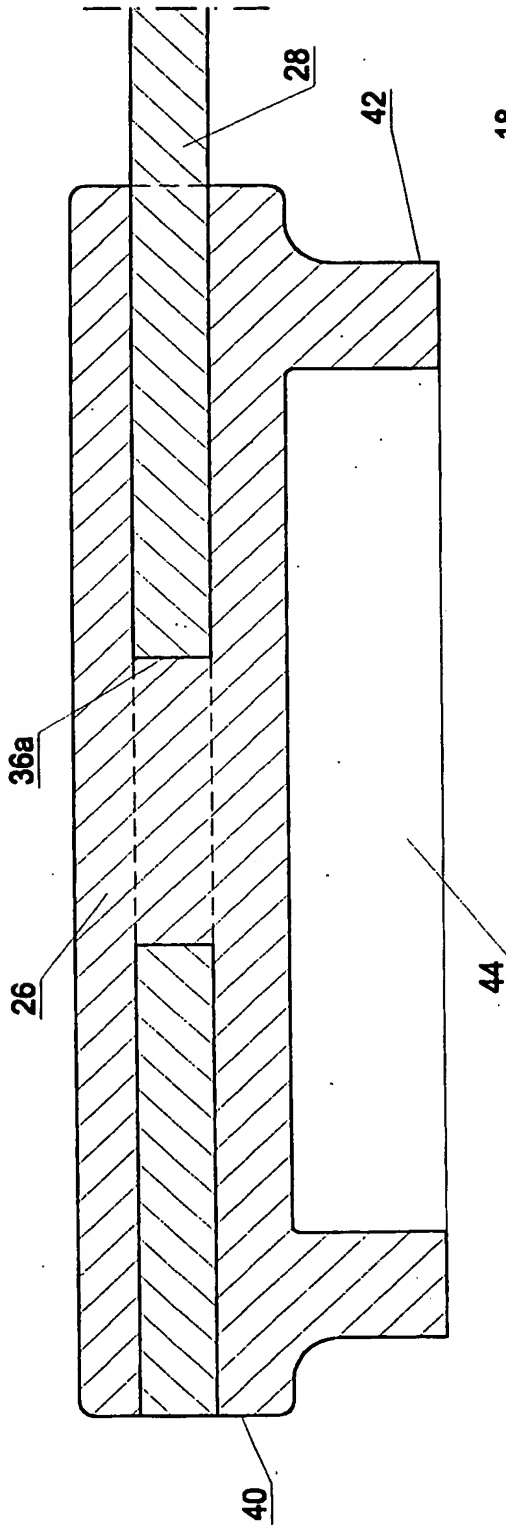


fig. 3

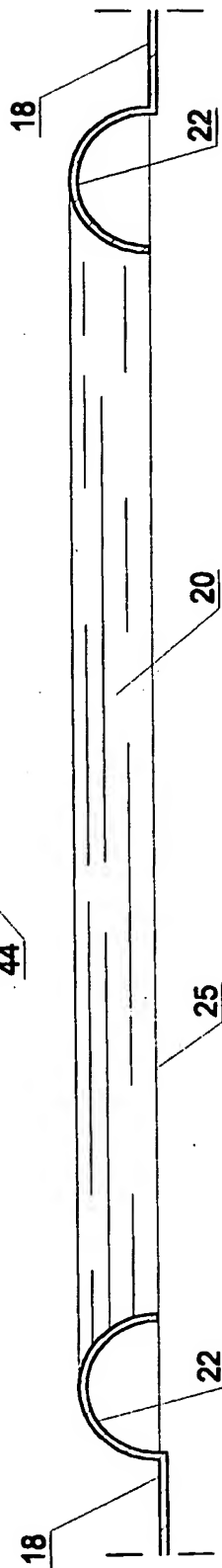


fig. 4

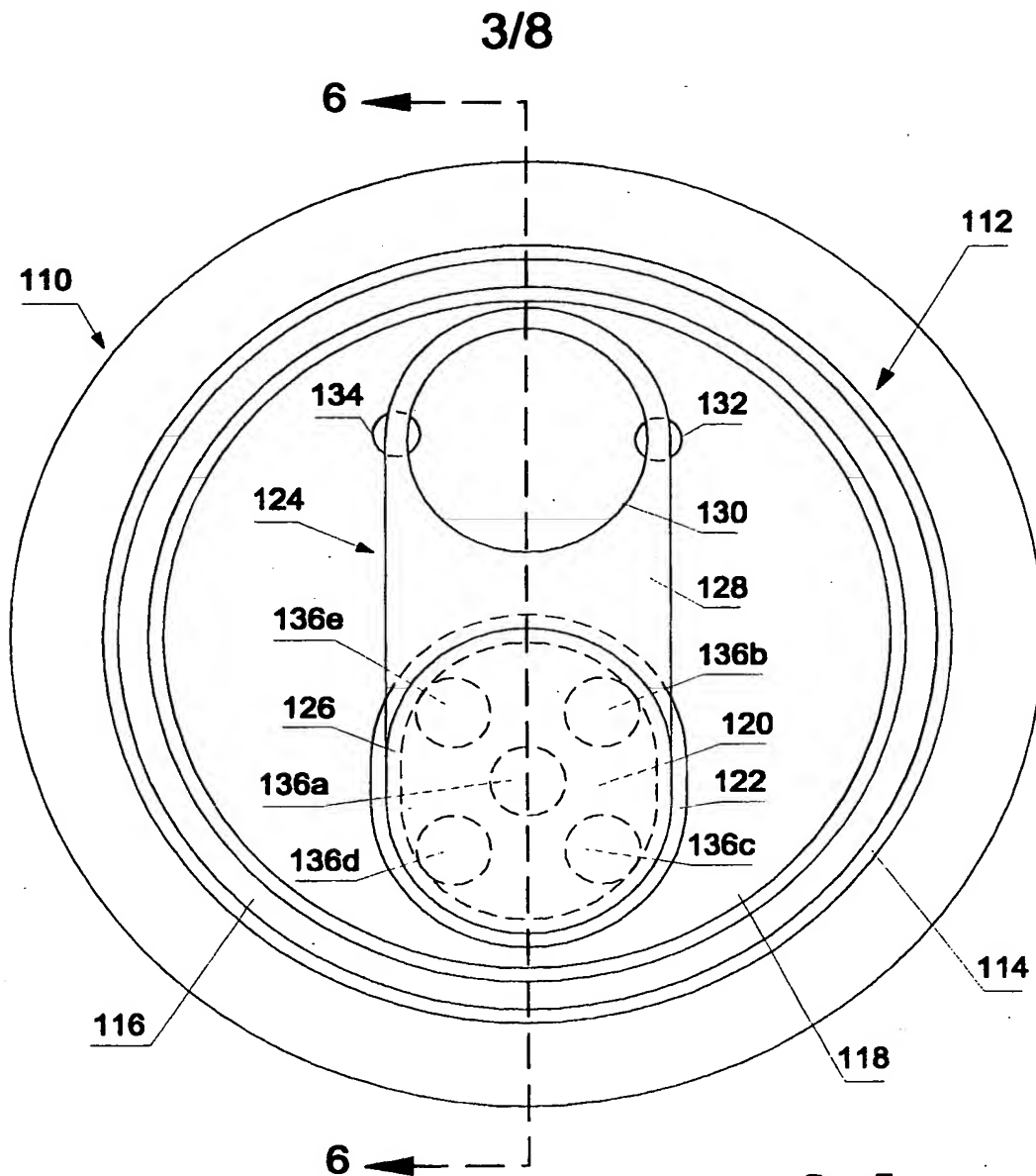


fig. 5

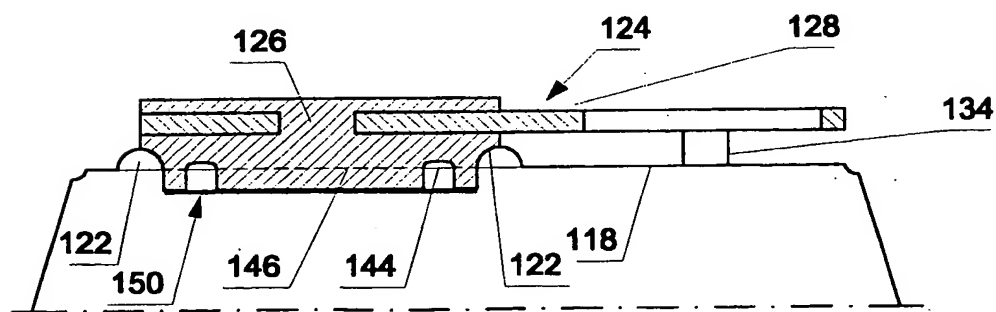
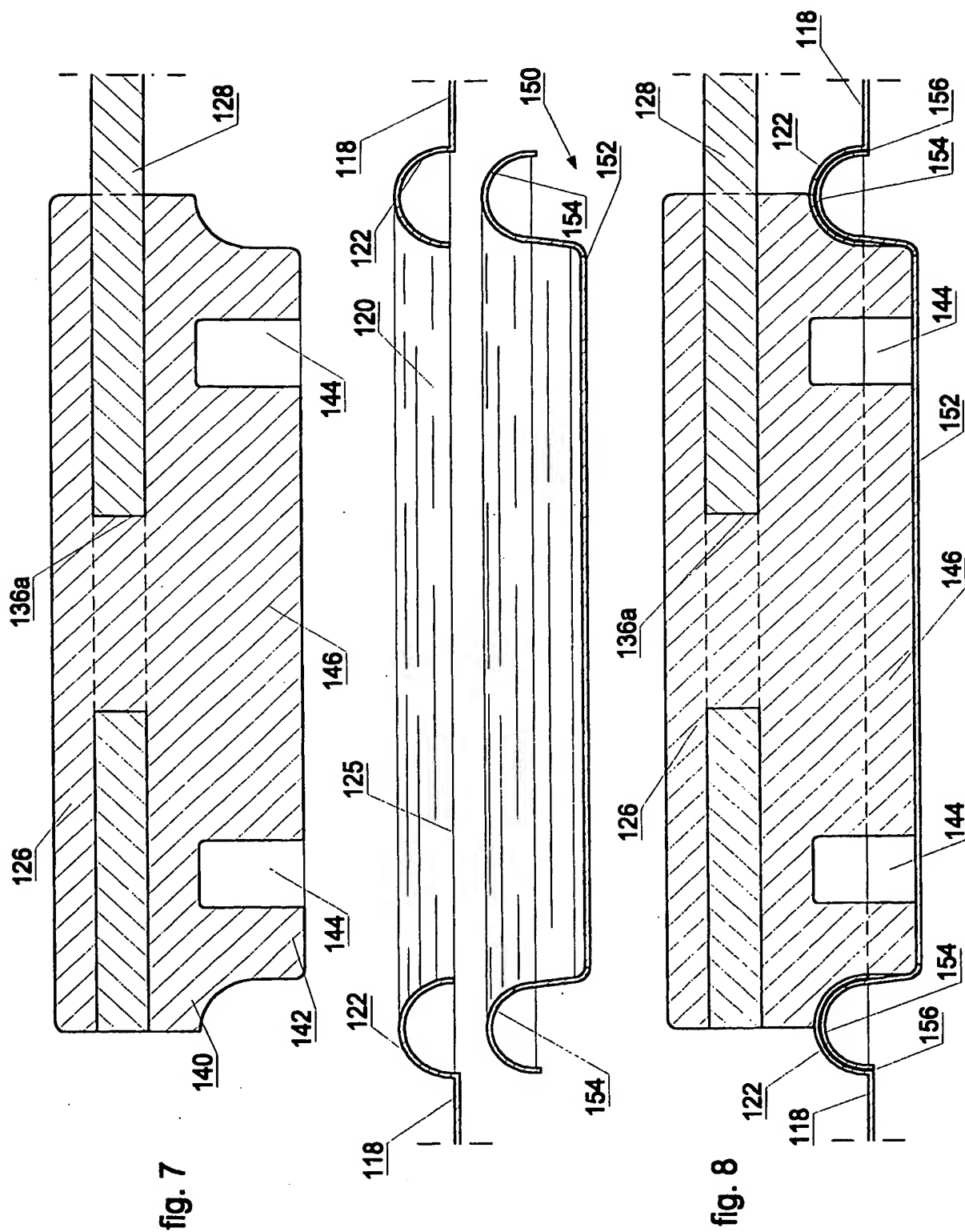


fig. 6



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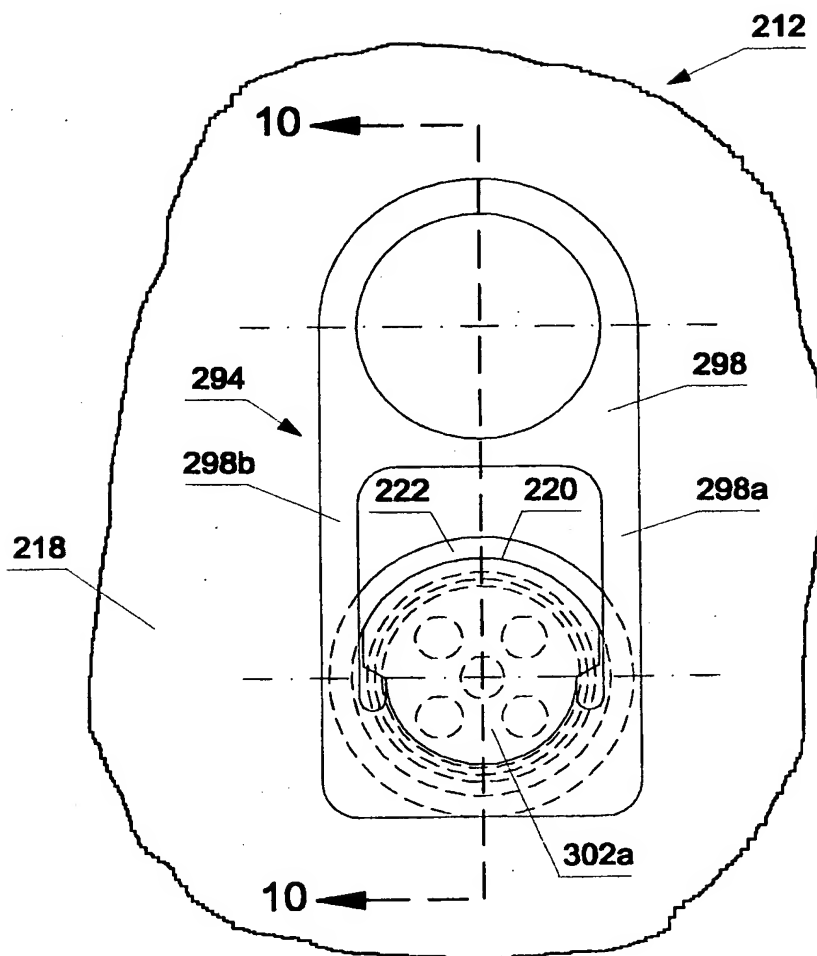


fig. 9

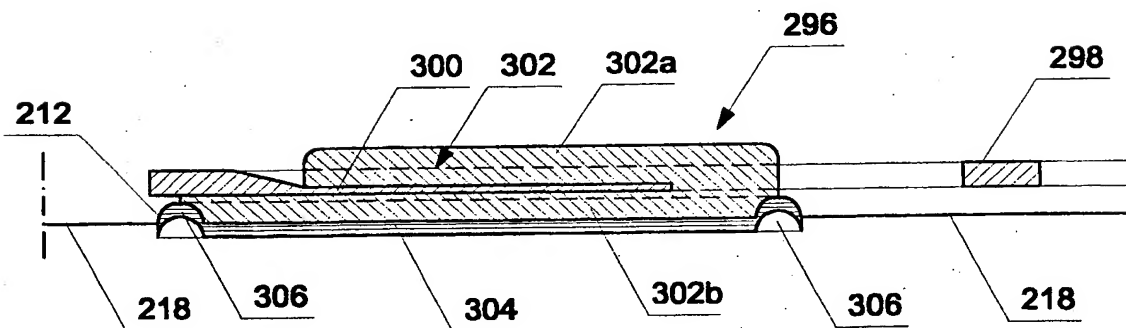


fig. 10

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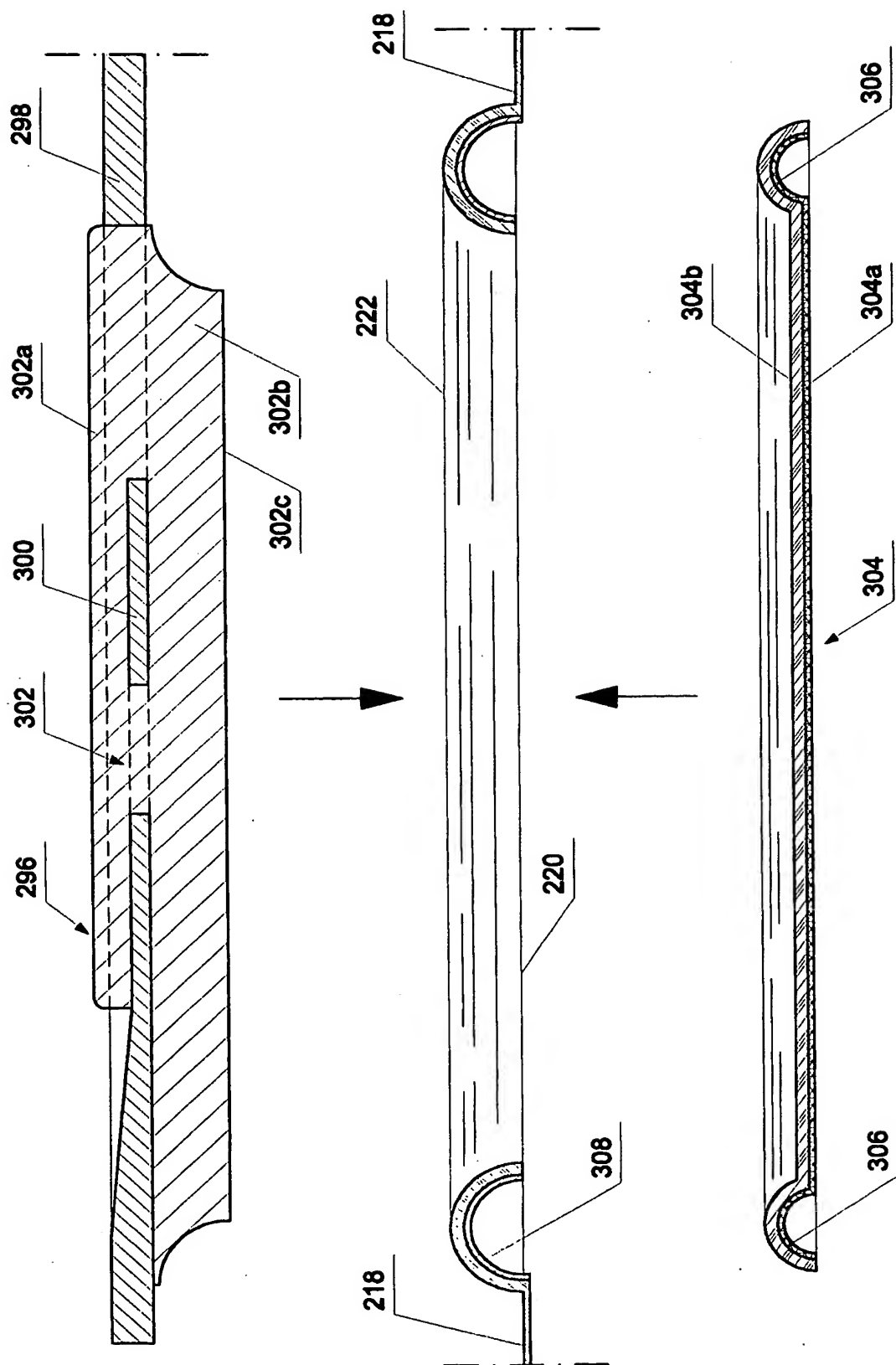


fig. 11

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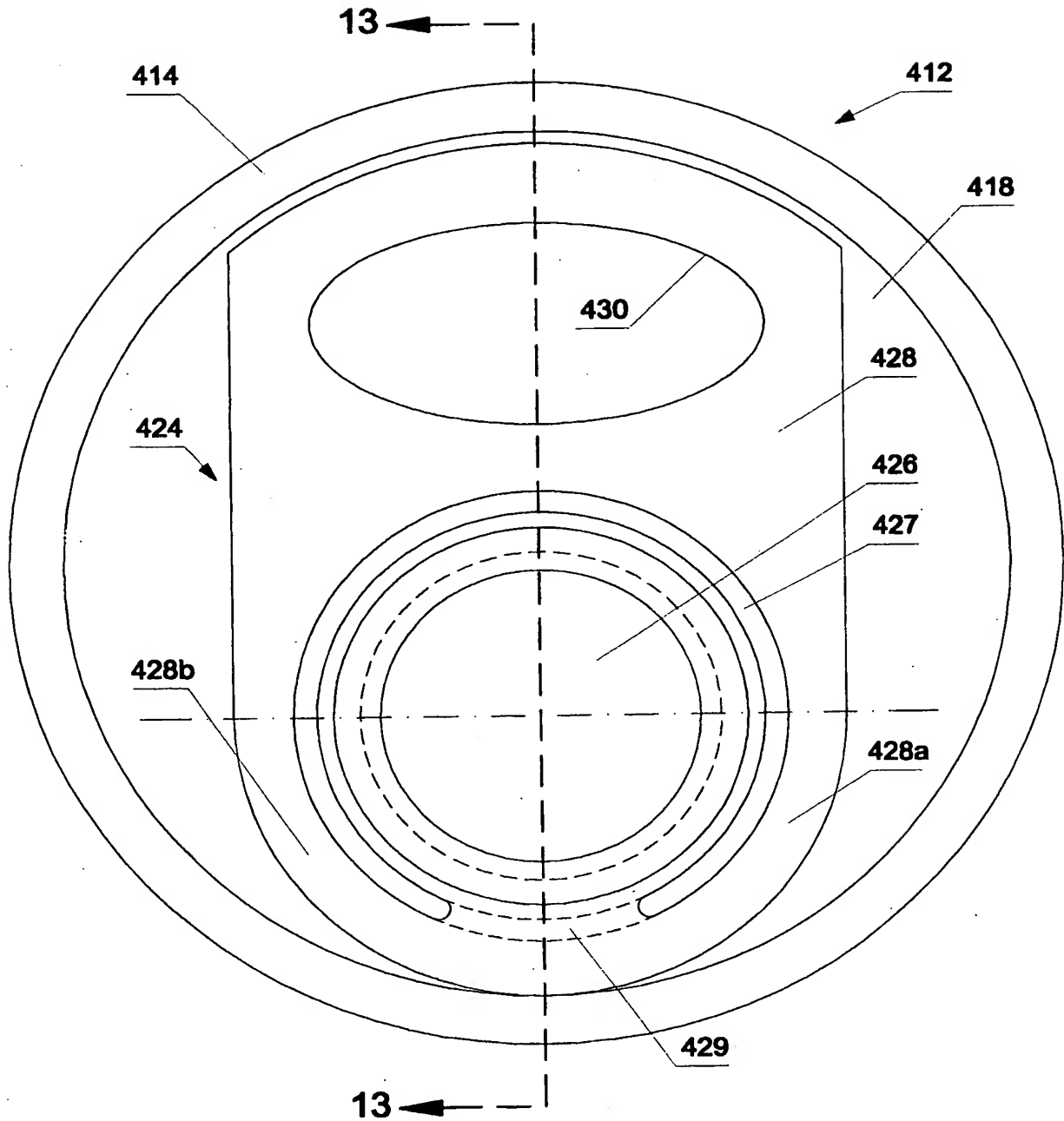
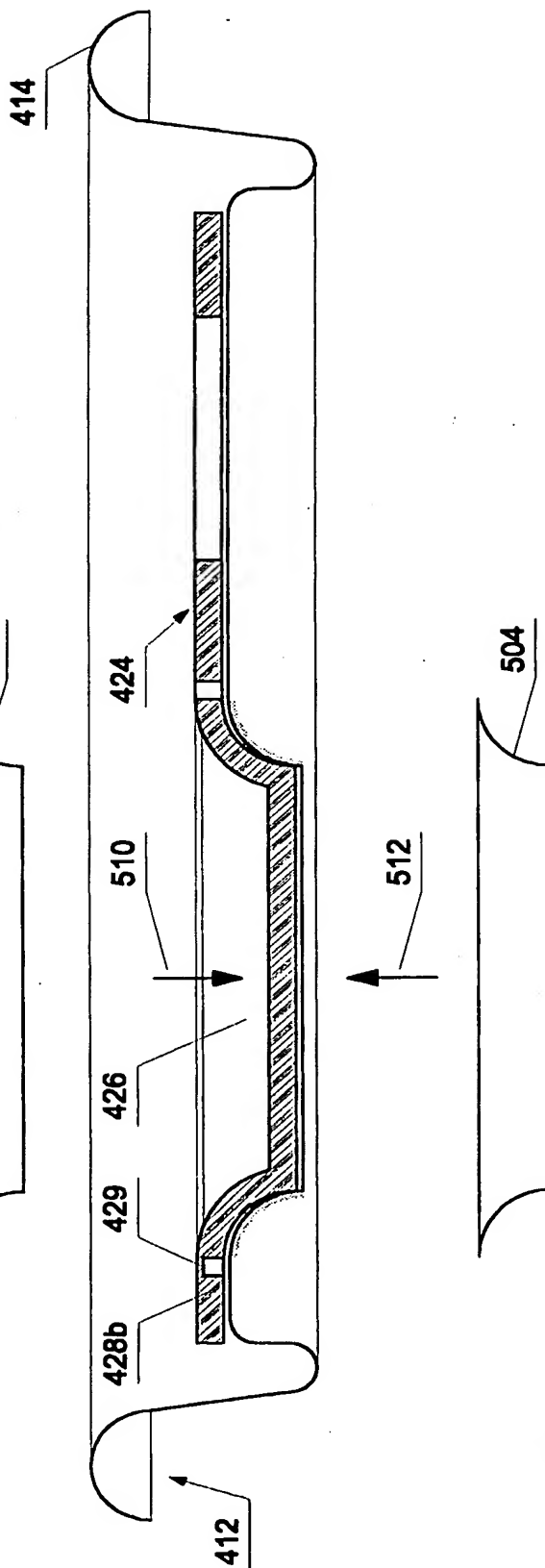
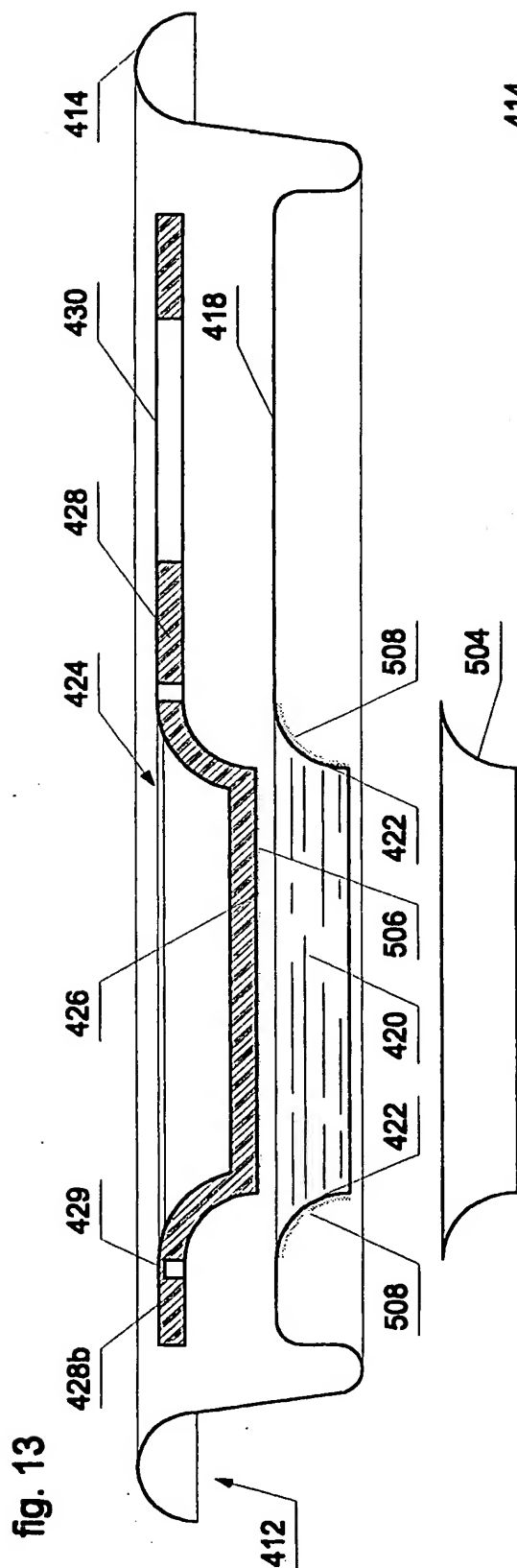


fig. 12

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INTERNATIONAL SEARCH REPORT

Inte Application No

PCT/EP 98/03183

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	DE 22 43 885 A (MASETTO) 26 April 1973 see page 3, line 24 - page 6, line 25; figures 1-4 ---	1,3,6
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